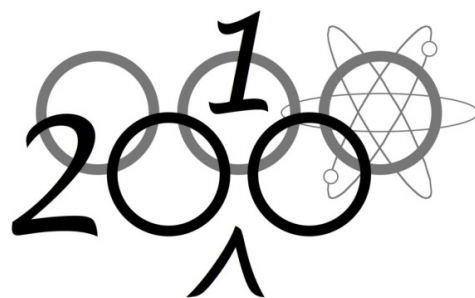


**Team**

**Rank**

# LIVERPOOL PHYSICS OLYMPICS



## ***Fermi Questions***

1. What is the average density of the earth?  kg/m<sup>3</sup>
2. If the super volcano in Yellowstone national park erupted leaving a thin layer of lava over the entire U.S.A, what is the surface area?  km<sup>2</sup>
3. Now many protons are there in a brick?
4. What is the total mass (in grams) of all the competitors in today's Physics Olympics?  g
5. How far away is the most distant object visible with the naked eye?  m
6. If a laser is pointed at the Moon, how big would the spot be?  m
7. If the Earth's human population continues to double every ten years, how long will it be before the mass of people exceeds that of the Earth itself?  years
8. A fly lands on a 35,000 tonne ocean liner. How much lower in the water will the ship settle?  m
9. If the Earth has 4x the diameter of the Moon and 6x the surface gravity, what is the ratio of the Earth's mass to the Moon's mass?
10. What is the gravitational potential energy of a hammer on the International space station (ignoring all other factors)?  J
11. How much energy is released in an earthquake measured at 4.5 on the Richter scale?  J
12. How many Hydrogen atoms fit on the head of a pin?
13. How many nucleons (protons and neutrons) are there in a typical nucleus?
14. How many seconds would it take to drive once around the sun following the path of the earth's orbit (no pit stops allowed!).  s